MI 19193
-A
-AL
-AH

BROADCAST ANTENNAS

-L
-H

RCA

Instructions

RADIO CORPORATION OF AMERICA, Industrial Electronic Products

R-F Load and Wattmeter

IB-36136-1

Tmk(s)®

EQUIPMENT LOST OR DAMAGED IN TRANSIT

When delivering the equipment to you, the truck driver or carrier's agent will present a receipt for your signature. Do not sign it until you have (a) inspected the containers for visible signs of damage and (b) counted the containers and compared with the amount shown on the shipping papers. If a shortage or if evidence of damage is noted, insist that notation to that effect be made on the shipping papers before you sign them.

Further, after receiving the equipment, unpack it and inspect thoroughly for concealed damage. If concealed damage is discovered, immediately notify the carrier, confirming the notification in writing, and secure an inspection report. This item should be unpacked and inspected for damage WITHIN 15 DAYS after receipt.

Report all shortages and damages to RCA, Broadcast and Television Department, Camden 2, N. J.

Radio Corporation of America will file all claims for loss and damage on this equipment so long as the inspection report is obtained. Disposition of the damaged item will be furnished by RCA.

REPLACEMENT PARTS AND ENGINEERING SERVICE

RCA field engineering service is available at current rates. Requests for field engineering service may be addressed to your RCA Broadcast Field Representative or the RCA Service Company, Inc., Broadcast Service Division, Camden, N. J. Telephone: WOodlawn 3-8000.

When ordering replacement parts, please give symbol, description, and stock number of each item ordered.

The part which will be supplied against an order for a replacement item may not be an exact duplicate of the original part. However, it will be a satisfactory replacement differing only in minor mechanical or electrical characteristics. Such differences will in no way impair the operation of the equipment.

The following tabulations list service parts and electron tube ordering instructions according to your geographical location.

SERVICE PARTS

LOCATION	ORDER SERVICE PARTS FROM:
Continental United States, including Alaska and Hawaii	RCA Electron Tube Division, Parts and Equipment, P.O. Box 654, Camden, New Jersey or through your nearest RCA Regional Office. Emergency orders may be telephoned, telegraphed, or teletyped to RCA Emergency Service, Bldg. 60, Camden, N. J. (Telephone: WO 3-8000).
Dominion of Canada	RCA Victor Company Limited, 1001 Lenoir Street, Montreal, Quebec or through your local Sales Representative or his office.
Outside of Continental United States, Alaska, Hawaii and the Dominion of Canada	RCA International Division, Clark, N. J., U.S.A. or through your local Sales Representative.

ELECTRON TUBES

LOCATION	ORDER ELECTRON TUBES FROM:
Continental United States, including Alaska and Hawaii	Local RCA Tube Distributor.
Dominion of Canada	RCA Victor Company Limited, 1001 Lenoir Street, Montreal, Quebec or through your local Sales Representative or his office.
Outside of Continental United States, Alaska, Hawaii and the Dominion of Canada	Local RCA Tube Distributor or from: Tube Department RCA International Division 30 Rockefeller Plaza New York 20, New York, U.S.A.

RETURN OF ELECTRON TUBES

If for any reason, it is desired to return tubes, please return them through your local RCA tube distributor, RCA Victor Co. Ltd., or RCA International Div., depending on your location.

PLEASE DO NOT RETURN TUBES DIRECTLY TO RCA WITHOUT AUTHORIZATION AND SHIPPING INSTRUCTIONS.

It is important that complete information regarding each tube (including type, serial number, hours of service and reason for its return) be given.

When tubes are returned, they should be shipped to the address specified on the Return Authorization form. A copy of the Return Authorization and also a Service Report for each tube should be packed with the tubes.

LIST OF RCA REGIONAL OFFICES

Atlanta 3, Georgia
1121 Rhodes-Haverty Bldg.
134 Peachtree St. N.W.
JAckson 4-7703

Boston 16, Mass.
Room 2301, John Hancock Bldg.
200 Berkley St.
HUbbard 2-1700

Chicago 54, Ill.
1186 Merchandise Mart Plaza
DElaware 7-0700

Cleveland 15, Ohio
1600 Keith Bldg.
CHerry 1-3450

Dallas 35, Texas
7901 Empire Freeway
FLeetwood 2-3911

Hollywood 28, Calif.
RCA Bldg., 1560 N. Vine St.
HOllywood 9-2154

Kansas City 6, Missouri
340 Home Savings Bldg.
HArrison 1-6480

New York 20, New York
36 W. 49th St.
JUdson 6-3800

Branch—San Francisco 2, Calif.
420 Taylor St.
ORdway 3-8027

Seattle, Washington
2250 First Ave., S.
MAin 2-8350

INSTRUCTIONS

R-F Load and Wattmeter

MI-19193
MI-19193-A
MI-19193-L
MI-19193-AL
MI-19193-H
MI-19193-AH

MANUFACTURED BY
RADIO CORPORATION OF AMERICA
INDUSTRIAL ELECTRONIC PRODUCTS
Camden, New Jersey, U. S. A.

PRINTED IN U.S.A.
DU-554-548-5119

IB-36136-1

FIRST AID

WARNING!

Operation of electronic equipment involves the use of high voltages which are dangerous to life. Operating personnel must at all times observe all safety regulations. Do not change tubes or make adjustments inside the equipment with voltage supply on. Under certain conditions dangerous potentials may exist in circuits with power controls in the off position due to charges retained by capacitors, etc. To avoid casualties, always discharge and ground circuits prior to touching them.

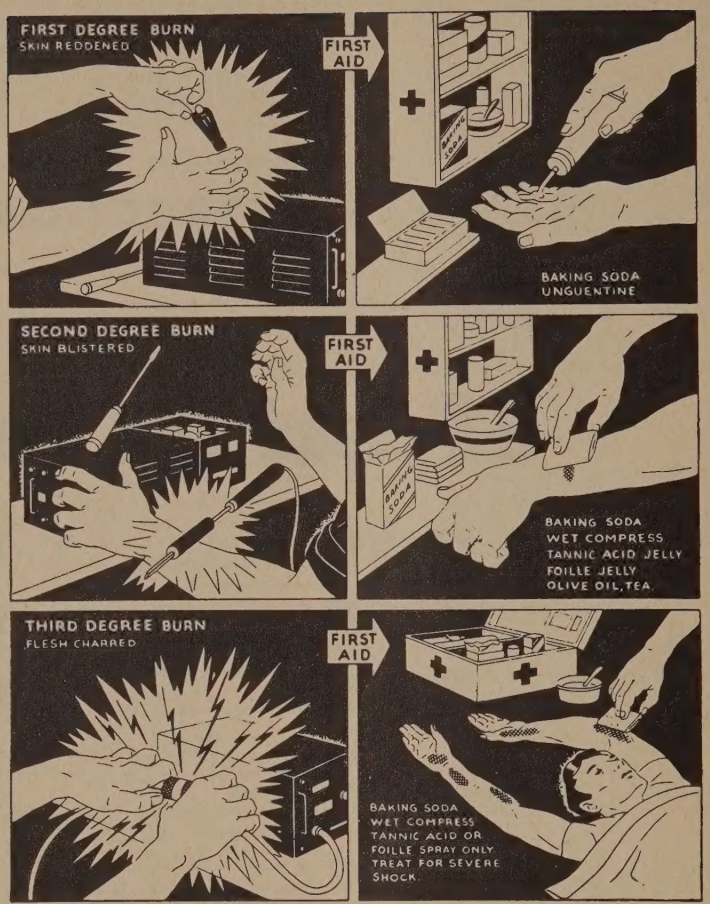
ABOUT FIRST AID

Personnel engaged in the installation, operation and maintenance of this equipment or similar equipment are urged to become familiar with the following rules both **in theory and in the practical application thereof.** It is the duty of every radioman to be prepared to give adequate First Aid and thereby prevent avoidable loss of life.

PRONE-PRESSURE METHOD OF RESUSCITATION

1. PROTECT YOURSELF with dry insulating material.
2. BREAK THE CIRCUIT by opening the power switch or by pulling the victim free of the live conductor.

DON'T TOUCH VICTIM WITH YOUR BARE HANDS UNTIL THE CIRCUIT IS BROKEN.



(A) (B) (C)

3. LAY PATIENT ON STOMACH, one arm extended, the other arm bent at elbow. Turn face outward resting on hand or forearm.
4. REMOVE FALSE TEETH, TOBACCO OR GUM from patient's mouth.
5. KNEEL STRADDLING PATIENTS THIGHS. See (A).
6. PLACE PALMS OF YOUR HANDS ON PATIENT'S BACK with little fingers just touching the lowest ribs.
7. WITH ARMS STRAIGHT, SWING FORWARD gradually bringing the weight of your body to bear upon the patient. See (B).
8. SWING BACKWARD IMMEDIATELY to relieve the pressure. See (C).
9. AFTER TWO SECONDS, SWING FORWARD AGAIN. Repeat twelve to fifteen times per minute.
10. WHILE ARTIFICIAL RESPIRATION IS CONTINUED, HAVE SOMEONE ELSE:
    (a) Loosen patient's clothing.
    (b) Send for doctor.
    (c) Keep patient warm.
11. IF PATIENT STOPS BREATHING, CONTINUE ARTIFICIAL RESPIRATION. Four hours or more may be required.
12. DO NOT GIVE LIQUIDS UNTIL PATIENT IS CONSCIOUS.

TABLE OF CONTENTS

	Page
TECHNICAL SUMMARY	
Electrical Specifications	5
Mechanical Specifications	5
EQUIPMENT	5
DESCRIPTION	6
Power Dissipating Section	6
Power Measuring Section	
Termaline	8
Thruline	8
INSTALLATION	10
OPERATION	12
MAINTENANCE	13
REPLACEMENT PARTS	14

LIST OF ILLUSTRATIONS

Figure		Page
1	MI-19193 or MI-19193-A R-F Load and Wattmeter	4
2	MI-19193-L, -H, -AL, or -AH R-F Load and Wattmeter	4
3	Simplified Schematic Diagram, Termaline Wattmeter	8
4	Schematic Diagram, Thruline Wattmeter	9
5	Outline Drawing, MI-19193 and MI-19193-A	15
6	Outline Drawing, MI-19193-L, -H, -AL, and -AH	16
7	Installation Schematic, MI-19193 and MI-19193-A	17
8	Installation Schematic, MI-19193-L, -H, -AL, and -AH	19

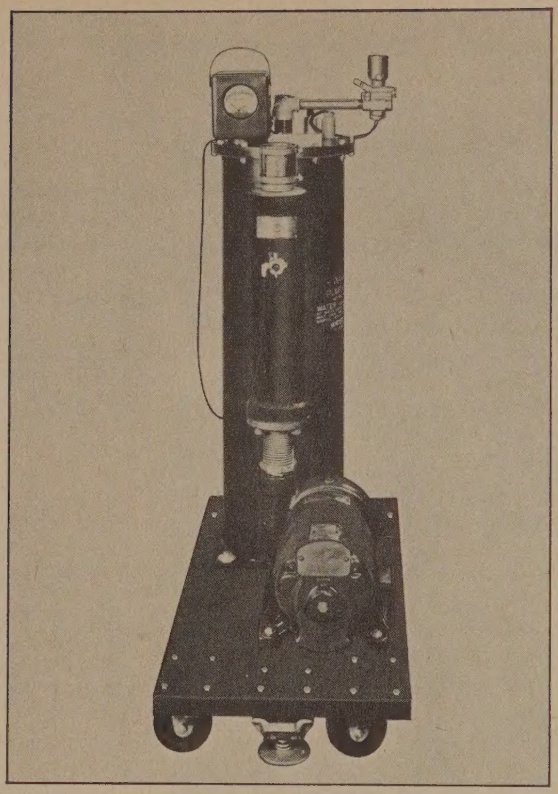


Figure 1 - MI-19193 or MI-19193-A R-F Load and Wattmeter

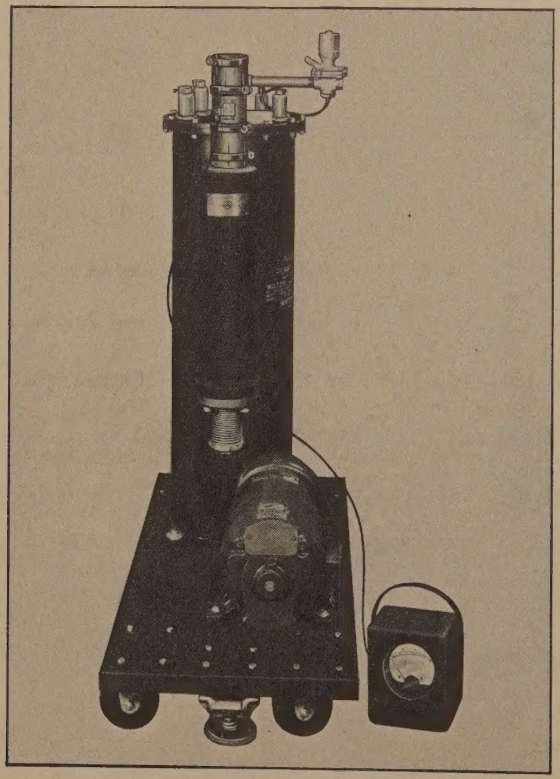


Figure 2 - MI-19193-L, -H, -AL, or -AH R-F Load and Wattmeter

TECHNICAL SUMMARY

ELECTRICAL SPECIFICATIONS

Power Rating (Average) ..... 25 kw (5000 feet max. elevation)
R-F Input Impedance ..... 51.5 ohms
Frequency Range
MI-19193 and MI-19193-A ..... 54 to 216 mc
MI-19193-L and MI-19193-AL ..... 54 to 108 mc
MI-19193-H and MI-19193-AH ..... 108 to 216 mc
A-C Power Input
MI-19193, MI-19193-L, and MI-19193-H ..... 60-cycle, one-phase, 1.125 kw
MI-19193-A, MI-19193-AL, and MI-19193-AH ..... 50-cycle, one-phase, 1.125 kw
Ambient Air Temperature
Maximum ..... 45 degrees C
Minimum ..... 15 degrees C

MECHANICAL SPECIFICATIONS

Mounting ..... floor (fixed or portable)
Water Required ..... 10 gpm (30 degrees C max.)
Water Connections
Inlet ..... 3/4-inch std. pipe
Outlet ..... 1-1/4-inch std. pipe
Intermediate Coolant Capacity ..... 18 gallons
Weight ..... 750 pounds
Dimensions ..... See Figures 5 and 6

EQUIPMENT

The components of the MI-19193 or MI-19193-A R-F Load and Wattmeter are listed in the following tabulation:

Quantity	Description
1	R-F Load Assembly
1	Wattmeter Assembly
1	Water Saver Valve

The components of the MI-19193-L, MI-19193-H, MI-19193-AL, or MI-19193-AH R-F Load and Wattmeter are listed in the following tabulation:

Quantity	Description
1	Heat Exchanger
1	R-F Load Unit Assembly
1	Coupling
1	Thruline Section
1	Meter Assembly
1	Wattmeter Element*

* Supplied with 54 to 108 megacycle range for MI-19193-L and -AL; or 108 to 216 megacycle range for MI-19193-H and -AH.

DESCRIPTION

The RCA 25-KW R-F Load and Wattmeter, Figure 1 or Figure 2, is a termination-type unit and is supplied for operation in the 54 to 216 mc (MI-19193 and MI-19193-A), 54 to 108 mc (MI-19193-L and MI-19193-AL), or 108 to 216 mc (MI-19193-H and MI-19193-AH) frequency range. The unit may be connected to either transmitter output, the sideband filter output, or either diplexer output.

A special film resistor, arranged as the center conductor of a tapered coaxial line to give an almost reflectionless termination, is used as the load resistance. The r-f power is converted to heat and dissipated through a water cooling system. Power dissipated in the load is measured across this resistor as a function of voltage. Indications of power are furnished by a Termaline Wattmeter on MI-19193 and MI-19193-A units; and by Thruline Wattmeters on all other equipments.

The unit may be best described by dividing it into two distinct sections; the power dissipating section and the power measuring section.

POWER DISSIPATING SECTION

This section consists of the load resistor, an intermediate coolant, a heat exchanger (cooling coil), and a motor-driven pump assembly which are mounted on a wheeled truck.

Two upright steel cylinders, which are joined at the top through a conduit and at the bottom through a motor-driven centrifugal pump, house the load resistor, the intermediate coolant, and the cooling coil. See Figure 7 or Figure 8. The smaller cylinder contains the load resistor surrounded by the coolant and the larger cylinder contains the cooling coil which is also immersed in the coolant.

Housed in the lower end of a length of transmission line which projects through a teflon seal located at the top of the smaller steel cylinder is the load resistor. The outer conductor of the transmission line is exponentially tapered down about the resistor to provide a reduction of surge impedance directly proportional to distance. Thus at the high end of the resistor the characteristic impedance is 51.5 ohms. Halfway down the resistor, the impedance is 25.75 ohms to compensate for the resistance already passed over. At the low end of the resistor, the transmission line outer conductor joins the inner. The teflon seal at the top of the cylinder provides both mechanical support for the transmission line inner conductor and a seal against coolant leakage.

The intermediate coolant, which has been chosen for chemical inactivity to prevent damage to the resistor, carries heat away from the resistor and provides a uniform dielectric constant for the transmission line. With r-f power applied, the coolant is heated by the resistor. The motor-driven circulating pump causes the coolant to rise past the resistor and enter the heat exchanger through the conduit. At the same time, the lower temperature coolant in the heat exchanger is forced to the bottom of the larger cylinder, into the pump, and up past the resistor.

The cooling coil is a helix of finned copper tubing. The cooling water is made to flow through the helix where it picks up and carries off heat from the intermediate coolant.

A 115/230-volt a-c motor with a self-contained thermal overload switch is used to drive the circulating pump. MI-19193, MI-19193-L, and MI-19193-H loads are equipped with 60-cycle motors while all other models, bearing an "A" designation, are furnished with 50-cycle motors.

As mentioned previously, water carries off the heat from the r-f energy flowing into the load. The lower the inlet temperature of the water, the more heat it can dissipate. As the power and water temperature inputs to the load vary, the actual water requirement of the load varies.

The water saver valve will minimize water flow into the cooling coil. It is controlled by the water saver thermoswitch which is located at the top of the large steel cylinder. In this manner, the water will flow only when the intermediate coolant temperature reaches a certain maximum limit. Thus, the water flow is automatically cut off when the load is not in operation. Power for the water saver valve should be available when the power is on at the transmitter.

In operation, the water saver valve solenoid is energized when the water saver thermoswitch closes. The solenoid opens a small pilot valve which admits full line water pressure to a spring-loaded diaphragm. The pressure exerted on the diaphragm actuates the main valve allowing water to flow into the load. Upon de-energization of the coil, the pilot valve closes, the pressure over the diaphragm dissipates into the low pressure (outlet) water line, and the spring closes the main valve stopping the flow of water into the load.

In addition to the water saver thermoswitch, an over temperature thermoswitch and an under temperature thermoswitch are also located at the top of the larger steel cylinder. Both of these switches should be connected in series with the transmitter interlock circuit, or if desired, to an auxiliary aural alarm system. The latter method will prevent the disablement of the transmitter during actual telecasts in cases where the r-f load is stored in a location that is cool enough to cause the under temperature thermoswitch to open.

The over temperature switch, when properly connected, will prevent an excessive rise of the intermediate coolant temperature and thereby preclude any damage to the resistor element.

The under temperature thermoswitch, which should be connected in a manner similar to the over temperature switch, will prevent the application of r-f power if the coolant temperature is below 15 degrees C (59 degrees F). Since the coolant possesses the property of a high boiling point, it also has a correspondingly high freezing temperature. If the coolant were congealed, circulation of the coolant would not be possible and heat would not be carried away from the load resistor.

An additional heater control thermoswitch is located at the top of the larger steel cylinder. This control is intended for use in conjunction with an external heating element, and will close if the temperature of the coolant should drop below 19 degrees C (69 degrees F); thus permitting a circuit hook-up which will prevent freezing of the intermediate coolant. However, a heater element should not be installed unless abnormally low ambient temperatures are anticipated.

INSTALLATION

The unit may be used in both fixed and portable applications. For use as a portable unit, a truck lock is mounted on the underside of the transport to keep the unit fixed while connected in the transmission system. Holes, 5/8-inch in diameter, are provided in the transport for fixed floor mounting.

Provisions should be made to allow interruption of the transmission line at any point where measurements are contemplated. Coaxial transfer panels (MI-27331 or MI-27332), which may be inserted in the transmission-line run at these points to provide rapid load switching, are available from RCA.

Refer to the appropriate outline drawing (Figure 5 or 6) and the appropriate installation schematic (Figure 7 or 8) and proceed as follows:

1. Place the unit in the proper location.

2. Connect the water drain pipe to a convenient drainage. Use 1-1/4-inch standard pipe or hose.

3. Connect the water saver valve to the horizontal pipe on top of the heat exchanger. Make this connection on the outlet side of the water saver valve (side in direction of arrow head on valve body). To screw the valve on the pipe, use a wrench on the valve ends. Do not use the solenoid cover as a lever. The valve should be installed in a vertical position with the solenoid cover uppermost.

4. Connect the water inlet pipe to a water source capable of delivering 10 gallons per minute. Use 3/4-inch standard pipe or hose to make this connection.

If the required source of water flow is not available from local water lines, a closed circuit system utilizing a water tank and an external circulating pump can be employed. For calculating purposes, the water pressure drop through the load at a water flow rate of 10 gallons per minute is 0.2 pound.

It is desirable to maintain the temperature of the water in the tank at 15 to 20 degrees centigrade as the water flow requirement decreases with lower water inlet temperatures. For example, a 15-kw power dissipation requires approximately 67 degree centigrade gallons per minute. For a water inlet temperature of 35 degrees C (permitting a 10-degree temperature rise since the water saver valve opens at 45 degrees C), a water flow of 6.7 gallons per minute is required whereas with a water inlet temperature of 25 degrees C (permitting a 20-degree temperature rise), a water flow of 3.3 gallons per minute is required. The temperature-differential and water-flow figure given in this paragraph includes a safety factor of approximately 15 percent.

The information in the preceding paragraph was computed using the following formula:

$$P = 0.263 (T_1 - T_2) F$$

where P = Power in load in kilowatts
T_1 = Outlet water temperature
T_2 = Inlet water temperature
F = Water flow in gallons per minute

Note: When computing the temperature-differential water-flow figure, multiply known value of input power to load by 1.15 to obtain 15 percent safety factor.

5. Make the electrical connections to the unit.

   a. The over temperature and under temperature switches should be connected in series with the transmitter interlock circuit.

   b. Connect one terminal of the water saver switch to one side of a 115-volt 50/60-cycle line. The other terminal on the switch should be connected to one of the water saver solenoid leads. The other solenoid lead should then be connected to the other side of the 115-volt line. The 115-volt line should be energized whenever the aural and visual transmitter filament circuits are energized.

      If only a 230-volt supply is available, a 115-volt source to operate the water saver may be obtained from the yellow and black (red tracer) leads in the pump motor.

   c. Connect the pump motor to a 115/230-volt 50 (MI-19193-A, MI-19193-AL, and MI-19193-AH) or 60 (MI-19193, MI-19193-L, and MI-19193-H) cycle power supply in such a manner as to insure pump operation prior to the application of r-f power. Follow the instructions on the motor nameplate.

6. Make the transmission-line connection to the unit. The equipment is designed for connection to RCA MI-19113 transmission line. If MI-19313 transmission line is used, an inner connector adapter, MI-19313-10, will be required.

7. Connect the meter cable to the meter jack on the power measuring section.

Units equipped with Termaline wattmeters are now ready for operation. For units employing Thruline wattmeters proceed with the following additional steps.

8. Install the wattmeter element in the reflectometer well on the Thruline transmission line section. The arrow on the element should be pointed toward the load. Store the dust cover in the empty socket in the meter.

9. Remove the vent plug (painted red) from the top of the dissipating unit. The unit is now ready for operation.

OPERATION

To place the unit in operation, the following procedure is recommended:

1. Make certain water pressure is on at the water saver valve.

2. Check the dielectric coolant level by removing the filler plug located on top of the power dissipating section. The coolant level must be within five inches of the filler-plug opening.

3. Ascertain that the coolant vent plug has been removed. This will allow the coolant to expand as the temperature increases.

4. Operate the pump switch to ON.

5. Apply r-f power. The water saver valve should open shortly after r-f power is applied to allow water to flow through the load. The valve will operate intermittently; the interval between each "on" period will depend on inlet water temperature and r-f power input to the load.

6. Observe the power-meter pointer. The power flowing into the load should now be indicated on the meter. Note however, that the meter reads average power and not peak power values.

7. If the unit is equipped with a Thruline wattmeter, rotate the wattmeter element to the reflected position. Under normal operating conditions, little or no power will be indicated on the meter.

The reflected wave may be measured to check the operation of the load. A defective load will cause a high standing wave ratio which would be indicated as a large amount of reflected power.

Determination of visual transmitter operating power in accordance with part 3.689 of the F.C.C. Rules and Regulations is made by measurement at the output of the vestigial sideband filter or filterplexer. For test purposes, power may be measured at any point in the transmission system. For measurements following the diplexer, only one transmission section (either visual or aural) should be energized for accurate results. Accurate results will not be obtained with multiplexed signals.

MAINTENANCE

The R-F Load and Wattmeter will require little in the way of maintenance. Components located inside the dissipating unit, the meter, or wattmeter elements, are not subject to field maintenance.

The outside surfaces of the instrument should be wiped free of dust when necessary.

Keep the jacks and connector plugs clean to avoid inaccurate readings due to poor electrical contact. It is advisable to keep the dust-plug in the wattmeter element socket, if an element is not in place, to insure safety and to prevent entry of dust.

The most likely source of damage to the equipment will be careless handling. DO NOT DROP ANY OF THE COMPONENTS. When more than one R-F Load and Wattmeter is available, be careful not to interchange either the wattmeter elements or the meters since these units are calibrated as a group. If a wattmeter element becomes damaged and requires replacement, return the Thruline section and meter to the factory when ordering, to insure accurate calibration.

Accurate measurement of the d-c resistance between the inner and outer conductors of the line coupling section will provide a good check of the condition of the load resistor. For this measurement, use a resistance bridge with an accuracy of one percent or better at 50 ohms. When the load unit is at room temperature, the measured resistance should be within one ohm of the value stamped on the name plate.

Check the coolant level periodically. Replenish if necessary. Use only the coolant referenced in the parts list.

If the water saver valve should become inoperative and need cleaning, remove the bonnet from the valve, clean the passages with a wire, clean the strainer, and re-assemble.

If water hammer is noted as the water saver valve closes, remove the acorn nut protruding from the side of the valve body, loosen the check nut and tighten the leak-off stud until the hammer is eliminated. The check nut and leak-off stud are located under the acorn nut. Retighten the check nut and replace the acorn nut.

Lubricate the pump-motor bearings periodically by placing a small amount of grease in the grease cups on the motor. See tag attached to motor for type of lubricant required. Do not use oil to lubricate the motor and be careful not to overlubricate the motor.

REPLACEMENT PARTS

Service parts for this equipment should be obtained from:

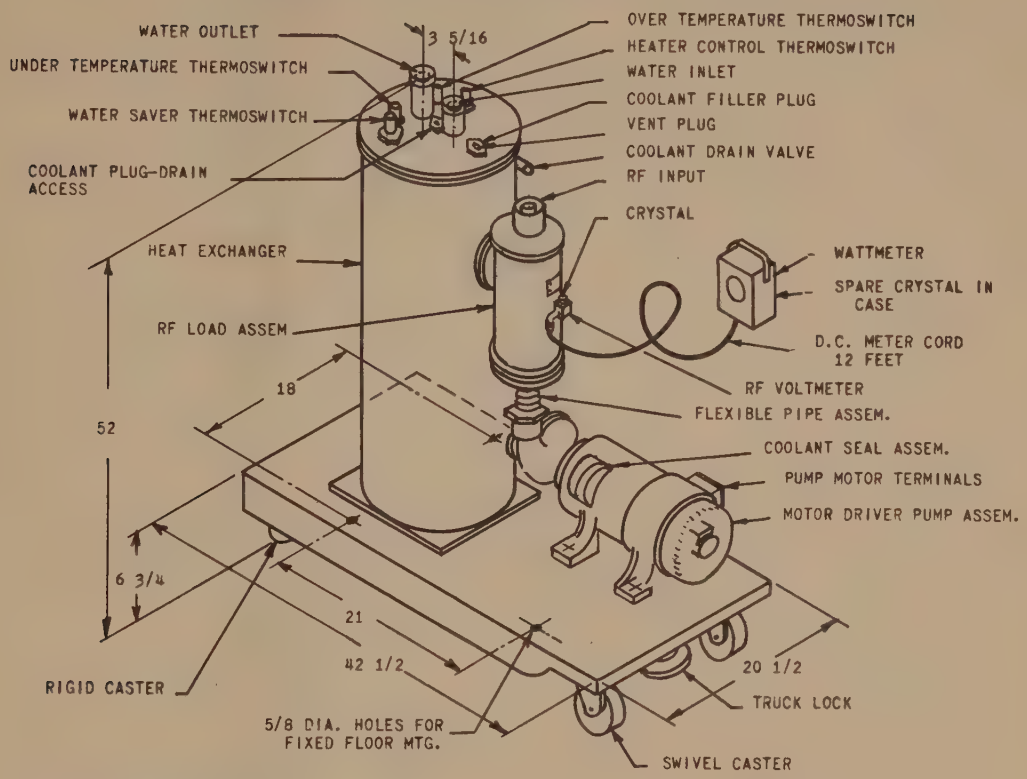
Bird Electronic Corporation
1800 East 38 Street,
Cleveland 14, Ohio

When ordering replacement parts, please give description and part number of each item ordered.

The part which will be supplied against an order for a replacement item may not be an exact duplicate of the original part. However, it will be a satisfactory replacement differing only in minor mechanical or electrical characteristics. Such differences will in no way impair the operation of the equipment.

ITEM NO.	DESCRIPTION	BIRD ELECTRONIC PART NUMBER
1	Pump, Motor Driven: 60-cycle; furnished with one load-flange gasket (Item 7), and one pump-flange gasket (Item 8)	502202
2	Pump, Motor Driven: 50-cycle; furnished with same accessories as above	502212
3	Pipe Assembly: flexible	502044
4	Seal Assembly, Pump-Shaft: includes seal, shaft, and seal-cap gasket	502047
5	Bearings, Motor: set of 2	502046
6	Brushes, Motor: set of 4	502048
7	Gasket, Load-Flange	502049
8	Gasket, Pump-Flange	502050
9	Caster, Fixed	502052
10	Caster, Swivel	502053
11	Truck Lock	502054
12	R-F Wattmeter Assembly: high or low band; includes Thruline section, meter-box assembly, and plug-in element. Supplied or repaired only as a complete assembly.	502205
13	Assembly, Housing and Resistor: includes "O"-ring seal	502064
14	Assembly, Resistor only	502078
15	D-C Meter Cord only: 12 feet long	502203
16	Thermoswitch, Water Saver	502115
17	Thermoswitch, Under Temperature	502116
18	Thermoswitch, Over Temperature	502117
19	Thermoswitch, Heater Control	502118
20	Thermoswitch-Cover Assembly	502062
21	Coolant: one-gallon cans	502123
22	Filler and Vent-Plug Assembly	502100
23	Plug, Access	502103
24	Valve, Water Saver	502119

MI-19193 RF LOAD AND WATTMETER - 60 CYCLES
MI-19193-A RF LOAD AND WATTMETER - 50 CYCLES



MECHANICAL SPECIFICATION:

WEIGHT	750 POUNDS
MOUNTING	FLOOR (FIXED OR PORTABLE)
CLEARANCE	24 INCHES
VENT PLUG	FULLY DISENGAGE THREAD BEFORE OPERATING UNIT
WATER CONNECTION	MALE 1 1/4 INCH STD. PIPE (OUTLET). MALE 3/4 INCH STD. PIPE (INLET)
WATER REQD.	10 G.P.M. (INTERMITTENT WHEN USED WITH WATER SAVER KIT MI-19398)
COOLANT CAPACITY	18 GALLONS APPROX. (STOCK NO. 97640)
AMBIENT TEMPERATURE	45° C. MAX.

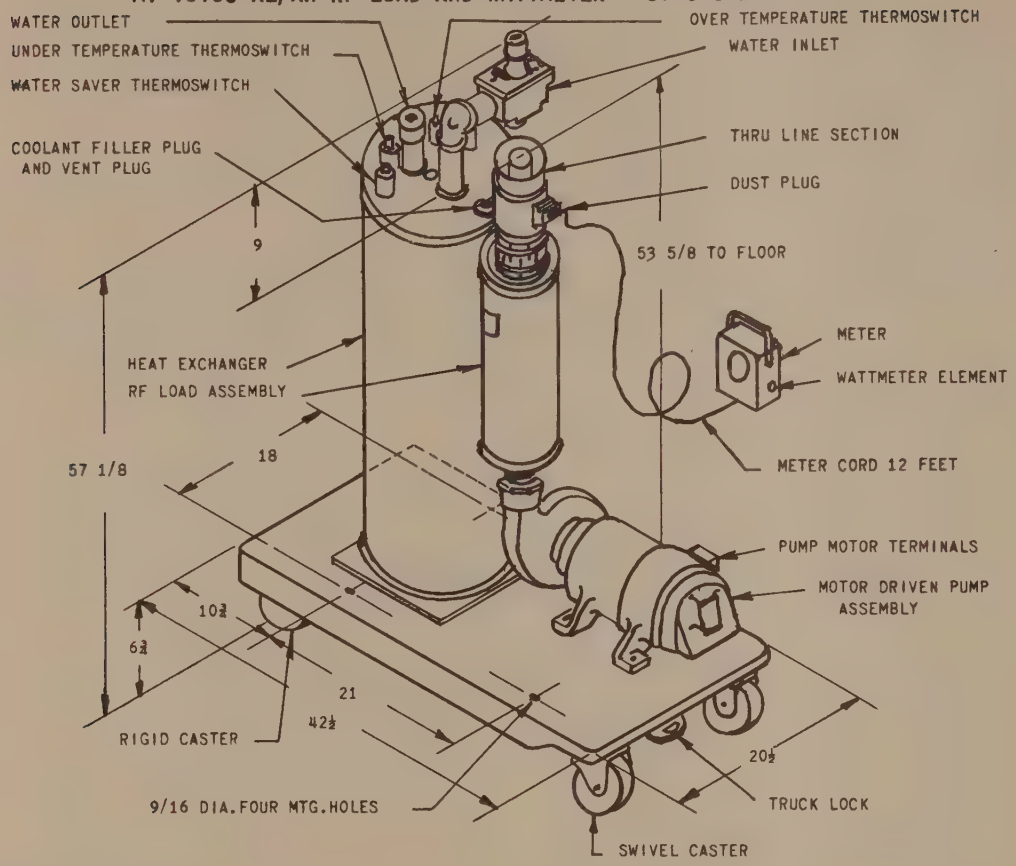
ELECTRICAL SPECIFICATION:

FREQUENCY	54 TO 216 MCS.
MAXIMUM POWER	25 KW (5000 FT. ELEVATION)
RF INPUT	51.5 OHMS, 3 1/8 INCH COAXIAL LINE
THERMOSWITCHES	5 AMP. MAX. IN-RUSH AT 220 VOLTS

B-466323

Figure 5 - Outline Drawing, MI-19193 and MI-19193-A

MI-19193 L/H RF LOAD AND WATTMETER - 60 CYCLES
MI-19193 AL/AH RF LOAD AND WATTMETER - 50 CYCLES



MECHANICAL SPECIFICATION

WEIGHT	750 POUNDS
MOUNTING	FLOOR (FIXED OR PORTABLE)
CLEARANCE	24 INCHES
VENT PLUG	FULLY DISENGAGE THREAD BEFORE OPERATING UNIT
WATER CONNECTION	MALE 1 1/4 INCH STD. PIPE (OUTLET) MALE 3/4 INCH STD. PIPE (INLET)
WATER REQD.	10 G.P.M. (INTERMITTENT)
COOLANT CAPACITY	18 GALLONS APPROX. (STOCK NO. 97640)
AMBIENT TEMPERATURE	45° C. MAX.

ELECTRICAL SPECIFICATION

FREQUENCY	54 TO 108 MCS. MI-19193L/AL
	108 TO 216 MCS. MI-19193H/AH
MAXIMUM POWER	25 KW (5000 FT. ELEVATION)
RF INPUT	51.5 OHMS, 3 1/8 INCH COAXIAL LINE
THERMOSWITCHES	5 AMP. MAX. IN-RUSH AT 220 VOLTS

ACCESSORY ITEMS

ADAPTER	INNER FOR MI-19313 COAXIAL LINE	MI-19313-10
COUPLING	STRAIGHT	MI-19113-8

B-471474

Figure 6 - Outline Drawing, MI-19193-L, -H, -AL, and -AH

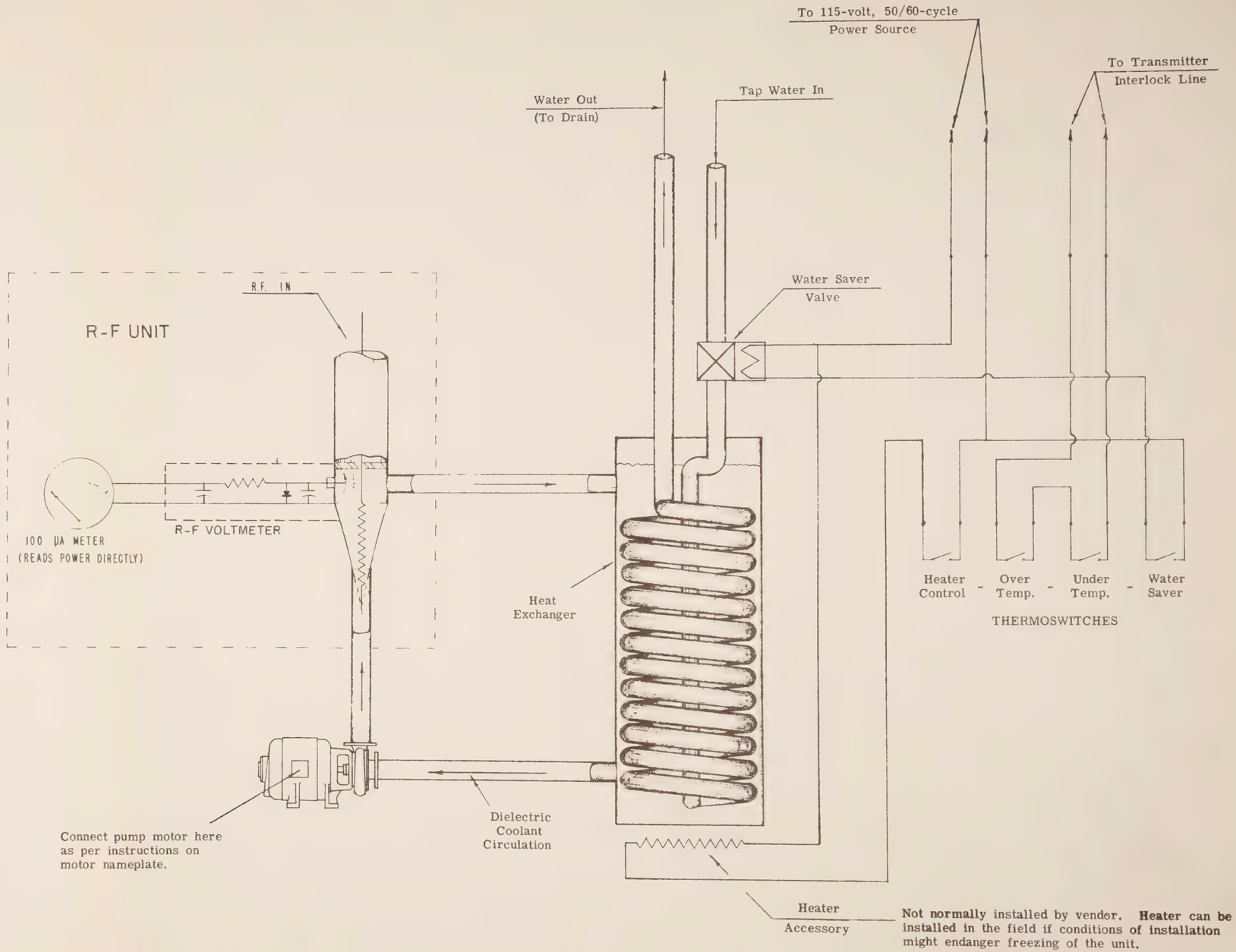


Figure 7 - Installation Schematic, MI-19193 and MI-19193-A

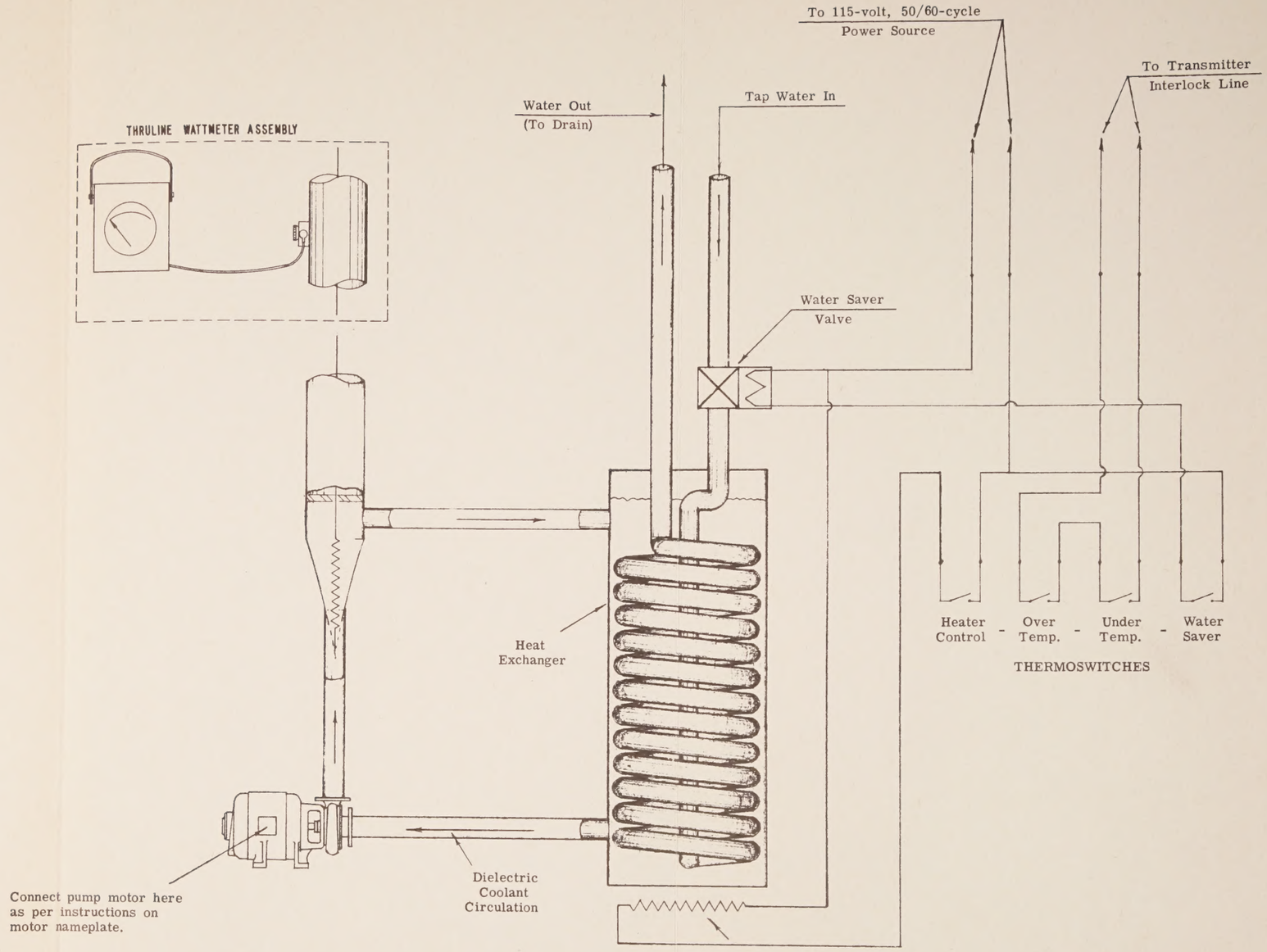


Figure 8 - Installation Schematic, MI-19193-L, -H, -AL, and -AH

RADIO CORPORATION OF AMERICA

INDUSTRIAL ELECTRONIC PRODUCTS, CAMDEN, N. J.